

BICYCLE TRANSPORTER

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REFERENCE TO RELATED APPLICATION

This is a continuation-in-part- application of the U.S. Patent Application having Serial No. 10/104,435, filed March 22, 2002.

BACKGROUND OF THE INVENTION

The present invention is an improvement on the inventor's previous patent having the same title. There are several improvements that are disclosed herein:

A bracket was added on the axle of the baby-jogging cart to allow more than one bicycle to be held even if the bicycles are different sizes. A second improvement is that the handle of the jogging cart was modified so that it could be opened allowing access for the towed bicycles' handlebars. Additionally, the handle was made flexible to allow rear wheel movement over rough terrain. The wheel of the jogging cart was reduced in size to allow for adult-sized bike to be towed and this modification increased stability on turns. The towing arm was modified so that it could be attached to either side of the bicycle. Transporter can now be indexed so left or right wheel can line up with towing bike wheels. Further stability was gained by lowering the position of the flexible coupling with respect to the towing bike frame. These improvements can benefit all bike trailers.

SUMMARY OF THE INVENTION

The object of this invention is to provide an apparatus for transporting at least one bicycle behind another bicycle. Such an apparatus is particularly useful for occasions in

which one bicyclist wishes to travel a shorter distance or take only a one-way trip and her partner is willing to assume the responsibility for towing her bicycle for the rest of the trip.

A further object of the present invention is to provide a pedal-powered bicycle transporter which can be used even if the child's bicycle has training wheels, thereby allowing it to serve for a long time as tool to motivate both the adult and child to enjoy a fun exercise together. The transporter provides a means to take children to school carrying the backpacks in the passenger area one way then carry empty bikes on return trip.

In accordance with the present invention, the apparatus comprises a baby-jogging cart equipped with a special adapter which allows it to be used as a trailer behind a bicycle. With this combination, an adult can exercise with a child, while the child gains confidence and stamina with her own bicycle. Once the child becomes tired, she can rest in the jogging cart, or trailer, while the adult, using the present invention, continues ride towing both her and her bicycle(s).

With the special adapter, a standard jogging cart can be towed behind a bicycle, with only a slight modification of the jogging cart and without modification to the towing bicycle. Rather, the special adapter includes a mounting bracket which, in use, is bolted or clamped onto the rear wheel support frame of the towing bicycle, near its rear axle. The mounting bracket comprises two meshing flange plates which are held in assembled relation by a single bolt having an enlarged nut. This nut is easily tightened without the

use of tools.

Also included in the special adapter are a hitch pin mounted on one of the flange plates, a towing arm, and a flexible member for connecting the hitch pin thereto. The flexible member, which is preferably a short section of flexible hose, is held in place on the hitch pin by a clamp. In addition, a safety strap fastened to the towing arm is secured to the frame of the towing bicycle.

Distal from the towing bicycle, the towing arm is attached to the jogging cart from where its front wheel has been temporarily removed. Means for holding the towing arm and the jogging cart in assembled relation comprises a spacer, a first bolt which is insertable therein, a pair of second bolts which protrude downwardly from the undercarriage of the cart seat, and winged nuts for threadedly engaging the first and second bolts. The spacer accounts for the difference in width between the towing bar and the front wheel of the jogging cart. The winged nuts allow for ease of installation and removal.

In use, one bicycle is towed with its front wheel turned and lifted and placed forward of rear axle, and aft of its vertical supports. This front wheel centers itself, due to its curvature, between the trailer wheels by resting on the two frame members. In essence this frame forms a wheel carrier. In practice a special wheel carrier bracket will be necessary for many trailer configurations to tow even a single bicycle. The handlebar of towed bike is then strapped to cart handle for vertical support and second strap holds wheel next to axle.

For towing second or more bicycles, a special wheel carrier bracket attached to the axle or back of the jogging cart. Means for temporarily securing the second bicycle to the rear of the cart include first and second straps, wheel carrier bracket and a support handle. The first strap confines the rim of the towed bike wheel within the wheel carrier bracket, the second strap limits the movement of the bicycle handle bars relative to the handle of the jogging cart.

With the front wheel of the towed bicycle so positioned, its steering post bearing facilitates turning movements. Also, the back wheel of the bicycle is free to move up or down so that it can roll easily over any roughness in the road. Further, the towed bike is free to lean as it goes around curves, shortening the turning radius.

The bicycle transporter according to the present invention can be used in combination with a wide variety of baby jogging cart models. Among these models are the Easy Strider (R) manufactured by Huffy (U.S. Patent Nos. 5,029,891, D315885) and a stroller/jogger from Instep (U.S. Patent No. 5,029,891). Alternately, the bicycle transporter can be used in combination with currently marketed bicycle trailers and trail-a-bike designs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective overview of the bicycle transporter according to the present invention, in use towing two bicycles;

FIGS. 2 and 3 are side perspective rearward perspective views, respectively, of the bicycle transporter according to FIG. 1, showing the bicycle's wheel in the wheel carrier and handle supporter and fragmentary portions of a jogging cart and a towed bicycle

mounted thereon;

FIG. 4 is a top perspective view of the bicycle transporter according to FIG. 1, showing bicycles handles bars being attached to the jogging cart handle and fragmentary portions of the jogging cart and two towed bicycles mounted thereon;

FIG. 5 is a perspective view of the bicycle transporter according to FIG. 1, showing the jogging cart handle in the open position ready for the bicycle's handlebar to be inserted, along with first and second straps used to secure the bicycles' handlebars and fragmentary portions of the jogging cart;

FIG. 6 is a top perspective view of the bicycle wheel carrier installed and fragmentary portions of the jogging cart:

FIG. 7 is a perspective view of the disassembled parts of the bicycle wheel carrier:

FIG. 8 is a bottom plan view of a fragmentary portion of the bicycle transporter according to FIG. 1, showing the towing arm in both the left hand (solid line) and the right hand (dashed line) towing position, as well as the undercarriage of the jogging cart to which the towing arm is attached;

FIG. 9 is a top plan view of two meshing flange plates which, when interlocked, comprise the mounting bracket in the bicycle transporter according to FIG. 1;

FIG. 10 is a exploded view of the mounting assembly and fragmentary portions of the flexible member in the bicycle transporter according to FIG. 1;

FIG. 11 is an exploded perspective view of the mounting bracket assembly, according to FIG. 10;

FIGS. 12 and 14 are side elevation views of a fragmentary portion of a bicycle having

a quick disconnect rear wheel and a standard bolted-on rear wheel, respectively, on which the bicycle transporter (not shown) according to FIG. 1 can be mounted; and

FIGS. 13 and 15 are perspective views of the mounting bracket assembly and a fragmentary portion of the flexible member in the bicycle transporter according to FIG. 1, the mounting bracket assembly being shown secured to the frame of the bicycle shown, as a fragment, in FIGS. 12 and 14, respectively.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings, a bicycle transporter according to the present invention includes a towing arm 30 and a mounting bracket assembly. Distal ends of the towing arm 30 are connected to the rear wheel of a first bicycle 2 and to a baby jogging cart 3, on the rear of which is secured towed bicycles 4, 5 (FIG. 1).

The mounting bracket assembly comprises two meshing flange plates 32, 33 which define central aperture 34 and end hole 36, respectively, and a hitch pin 44 (FIGS. 6, 7 and 8). The hitch pin 44 includes a bolt 35 which is held in place within an end aperture 40 defined by the longer flange plate 32 by a series of nuts and washers.

Once the flange plates 32, 33 have been coupled, they are installed on the first bicycle 2, which can have a quick disconnect rear wheel as shown prior to and post installation in FIGS. 12 and 13, respectively. Alternately, the meshing flange plates 32, 33 can be mounted on a bicycle having a standard bolted-on rear wheel (FIGS. 14 and 15).

To install the mounting bracket assembly, one positions longer flange plate 32, with the shorter plate 33 coupled thereto, inside the rear wheel support structure of the bicycle 2. Shorter flange plate 32 is then moved into such a position that bolt 35 can be simultaneously retained within center aperture 34 and inserted into end hole 36 (FIGS. 10, 11 and 9). Means for retaining the flange plates 32, 33 and bolt 35 in assembled relation, clamped to the rear wheel support structure, comprises a nut 37 having a large handle head. Preferably, the flange plates 32, 33 are also provided with pads 38, 39 to protect the finish on the bicycle frame (FIGS. 10, 11).

Means for securing the towing arm 30 to the mounting bracket assembly comprises a flexible connector 45 attached at its distal ends to the hitch pin 44 and to the towing arm, respectively (FIGS. 10 and 8). A clamp 46 is used to hold the flexible connector 45 in place on the hitch pin 44 (FIGS. 6, 11, 13). In the preferred embodiment, the flexible connector 45 is a hose which measures, by way of example, 1 inch in diameter and 10 inches long. In addition, distal ends of a first safety strap 49 are attached to the towing arm 30 and to the rear wheel support structure (FIGS. 13 and 15).

Shaped roughly in the form of a large imaginary question mark, the towing arm 30 defines an arcuate front section which allows the towed jogging cart 3 to be centered behind the rear wheel of the towing bicycle 2 (FIG. 8). Rearwardly of the arcuate front section, the towing arm 30 is attached to the front wheel mount of the jogging cart 3 with a bolt, threadably engageable with a wing nut 48, and a spacer 47 (FIG. 8). Means for

attaching the towing arm 30 to the undercarriage of the baby jogging cart include two bolts which protrude downwardly therefrom and winged nuts 9, 10 for threadedly engaging them. .

The bicycle wheel carrier 54 is comprised of a long bracket 55 and a short bracket 56 and fasteners 57, 58 and 59 as shown disassembled on FIG. 7 and installed on the axle 7 and axle support 8 of the jogging cart 3 as shown on FIG. 6. The transporter is now ready for receiving the towed bicycle 5.

The procedure for securing the towed bicycles 4 and 5 to the rear of the jogging cart 3 as follows: The front wheel 6 of large bicycle 5 is turned approximately 90 degrees and placed in front of the cart's rear axle 7 (FIGS. 1, 2, 3). A quick opening strap 21 is then inserted through the spokes and secured around both the rim of wheel 6 and the axle 7. Next the handle 50 of the jogging cart 3 is opened as shown in FIG. 5 and the handlebar stem of bicycle 5 is placed under the handle 50 as shown in FIG. 4 and the handle 50 is closed using fastener 52, then a band having quick opening and closure is wrapped around handlebar stem which keeps the bicycle 5 in vertically normally upright position. Next the smaller bicycle 4 has its front wheel 52 turned 90 degrees and placed in the bicycle in wheel carrier 54 and strap 22 fastens the wheel into the wheel carrier. A strap 53 is then fastened around the handlebar of bicycle 4 and the cart's handle 50. The two bikes are now vertical and ready to be towed. The towed bicycles 4, 5 can be mounted on or removed from the transporter in an interval less than one minute.

In operation, the bicycle transporter according to the present invention allows the bicyclist to tow the jogging cart 3 and bicycles 4, 5 in tandem or individually, even over

rough roads and curbs. With its mechanism for mounting the towed bicycle(s) 4 and 5, the bike transporter can be utilized even while a child reclines in the seat of the baby jogging cart 3 and her bicycle 4 or 5 is being towed.

It is understood that those skilled in the art may conceive other applications, modifications and/or changes in the invention described above. Any such applications, modifications or changes which fall within the purview of the description are intended to be illustrative and not intended to be limitative. The scope of the invention is limited only by the scope of the claims appended hereto.